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Application No.: 10/666,615

Case No.: 58354US002

Amendments to the Claims:

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-5. (Canceled)

6. (Currently Amended) [The] A method for making a glass-ceramic, the method comprising heat-treating glass to convert at least a portion of the glass to crystalline ceramic and provide glass-ceramic, the glass comprising at least 50 percent by weight Al_2O_3 , based on the total weight of the glass, REO, ZrO_2 , and at least one of Nb_2O_5 or Ta_2O_5 , wherein the glass contains not more than 10 percent by weight collectively As_2O_3 , B_2O_3 , GeO_2 , P_2O_5 , SiO_2 , TeO_2 , and V_2O_5 , based on the total weight of the glass, wherein the glass comprises ZrO_2 , and wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of Nb_2O_5 and Ta_2O_5 [according to claim 2, wherein the glass comprises at least 50 percent by weight Al_2O_3 , based on the total weight of the glass].

7. (Canceled)

8. (Currently Amended) A [The] method for making a glass-ceramic, the method comprising heat-treating glass to convert at least a portion of the glass to crystalline ceramic and provide glass-ceramic, the glass comprising at least 40 percent by weight Al_2O_3 , based on the total weight of the glass, REO, at least 20 percent by weight ZrO_2 , based on the total weight of the glass, and at least one of Nb_2O_5 or Ta_2O_5 , wherein the glass contains not more than 10 percent by weight collectively As_2O_3 , B_2O_3 , GeO_2 , P_2O_5 , SiO_2 , TeO_2 , and V_2O_5 , based on the total weight of the glass, and wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of

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Nb₂O₅ and Ta₂O₅ [according to claim 2, wherein the glass comprises at least 20 percent by weight ZrO₂, based on the total weight of the glass].

9-10. (Canceled)

11. (Currently Amended) A [The] method for making a glass-ceramic, the method comprising heat-treating glass to convert at least a portion of the glass to crystalline ceramic and provide glass-ceramic, the glass comprising at least 50 percent by weight Al₂O₃, at least 30 percent by weight REO, and at least 10 percent by weight ZrO₂, based on the total weight of the glass, and at least one of Nb₂O₅ or Ta₂O₅, wherein the glass contains not more than 10 percent by weight collectively As₂O₃, B₂O₃, GeO₂, P₂O₅, SiO₂, TeO₂, and V₂O₅, based on the total weight of the glass, and wherein the at least one of Nb₂O₅ or Ta₂O₅ is present in an amount sufficient to increase the rate of crystalline ZrO₂ formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of Nb₂O₅ and Ta₂O₅ [according to claim 1, wherein the glass comprises at least 50 percent by weight Al₂O₃, at least 30 percent by weight REO, and at least 10 percent by weight ZrO₂].

12-34. (Canceled)

35. (Currently Amended) A [The] method for making abrasive particles, the method comprising heat-treating glass particles to convert at least a portion of the glass to crystalline ceramic to provide glass-ceramic abrasive particles, the glass comprising at least 50 percent by weight Al₂O₃, based on the total weight of the glass, REO, ZrO₂, and at least one of Nb₂O₅ or Ta₂O₅, wherein the glass contains not more than 10 percent by weight collectively As₂O₃, B₂O₃, GeO₂, P₂O₅, SiO₂, TeO₂, and V₂O₅, based on the total weight of the glass, and wherein the at least one of Nb₂O₅ or Ta₂O₅ is present in an amount sufficient to increase the rate of crystalline ZrO₂ formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of Nb₂O₅ and Ta₂O₅ [according to claim 31, wherein the glass comprises at least 50 percent by weight Al₂O₃, based on the total weight of the glass].

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36. (Canceled)

37. (Currently Amended) A [The] method for making abrasive particles, the method comprising heat-treating glass particles to convert at least a portion of the glass to crystalline ceramic to provide glass-ceramic abrasive particles, the glass comprising at least 35 percent by weight Al_2O_3 , based on the total weight of the glass, REO, at least 20 percent by weight ZrO_2 , based on the total weight of the glass, and at least one of Nb_2O_5 or Ta_2O_5 , wherein the glass contains not more than 10 percent by weight collectively As_2O_3 , B_2O_3 , GeO_2 , P_2O_5 , SiO_2 , TeO_2 , and V_2O_5 , based on the total weight of the glass, and wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of Nb_2O_5 and Ta_2O_5 [according to claim 31, wherein the glass comprises at least 20 percent by weight ZrO_2 , based on the total weight of the glass].

38-39. (Canceled)

40. (Currently Amended) A [The] method for making abrasive particles, the method comprising heat-treating glass particles to convert at least a portion of the glass to crystalline ceramic to provide glass-ceramic abrasive particles, the glass comprising at least 50 percent by weight Al_2O_3 , at least 30 percent by weight REO, at least 10 percent by weight ZrO_2 , based on the total weight of the glass, and at least one of Nb_2O_5 or Ta_2O_5 , wherein the glass contains not more than 10 percent by weight collectively As_2O_3 , B_2O_3 , GeO_2 , P_2O_5 , SiO_2 , TeO_2 , and V_2O_5 , based on the total weight of the glass, and wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass as compared to a comparative glass-ceramic made by heat-treating, in the same manner, the same glass free of Nb_2O_5 and Ta_2O_5 [according to claim 31, wherein the glass comprises at least 50 percent by weight Al_2O_3 , at least 30 percent by weight REO, and at least 10 percent by weight ZrO_2].

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41-61. (Canceled)

62. (New) The method according to claim 6, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

63. (New) The method according to claim 6, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

64. (New) The method according to claim 6, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

65. (New) The method according to claim 6, wherein the REO is at least one of Gd_2O_3 , La_2O_3 , or Nd_2O_3 .

66. (New) The method according to claim 6, further crushing the glass-ceramic to provide abrasive particles.

67. (New) The method according to claim 66, further comprises grading the abrasive particles to provide a plurality of particles having a specified nominal grade.

68. (New) The method according to claim 66 further comprises incorporating the abrasive particles into an abrasive article.

69. (New) The method according to claim 6, wherein the glass-ceramic has an average hardness of at least 15 GPa.

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70. (New) The method according to claim 6, wherein the glass-ceramic has an average hardness of at least 17 GPa.

71. (New) The method according to claim 6, wherein the glass-ceramic has an average hardness of at least 18 GPa.

72. (New) The method according to claim 6, wherein the glass-ceramic has an average hardness of at least 19 GPa.

73. (New) The method according to claim 8, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

74. (New) The method according to claim 8, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

75. (New) The method according to claim 8, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

76. (New) The method according to claim 8, further crushing the glass-ceramic to provide abrasive particles.

77. (New) The method according to claim 76, further comprises grading the abrasive particles to provide a plurality of particles having a specified nominal grade.

78. (New) The method according to claim 76 further comprises incorporating the abrasive particles into an abrasive article.

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79. (New) The method according to claim 8, wherein the glass-ceramic has an average hardness of at least 15 GPa.

80. (New) The method according to claim 8, wherein the glass-ceramic has an average hardness of at least 18 GPa.

81. (New) The method according to claim 8, wherein the glass-ceramic has an average hardness of at least 19 GPa.

82. (New) The method according to claim 11, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

83. (New) The method according to claim 11, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

84. (New) The method according to claim 11, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

85. (New) The method according to claim 11, wherein the REO is at least one of Gd_2O_3 , La_2O_3 , or Nd_2O_3 .

86. (New) The method according to claim 11, further crushing the glass-ceramic to provide abrasive particles.

87. (New) The method according to claim 86, further comprises grading the abrasive particles to provide a plurality of particles having a specified nominal grade.

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88. (New) The method according to claim 86 further comprises incorporating the abrasive particles into an abrasive article.

89. (New) The method according to claim 11, wherein the glass-ceramic has an average hardness of at least 15 GPa.

90. (New) The method according to claim 11, wherein the glass-ceramic has an average hardness of at least 18 GPa.

91. (New) The method according to claim 11, wherein the glass-ceramic has an average hardness of at least 19 GPa.

92. (New) The method according to claim 35, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

93. (New) The method according to claim 35, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

94. (New) The method according to claim 35, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

95. (New) The method according to claim 35, wherein the REO is at least one of Gd_2O_3 , La_2O_3 , or Nd_2O_3 .

96. (New) The method according to claim 35, further comprises grading the glass-ceramic abrasive particles to provide a plurality of particles having a specified nominal grade.

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97. (New) The method according to claim 35 further comprises incorporating the glass-ceramic abrasive particles into an abrasive article.

98. (New) The method according to claim 35, wherein the glass-ceramic abrasive particles have an average hardness of at least 17 GPa.

99. (New) The method according to claim 35, wherein the glass-ceramic abrasive particles have an average hardness of at least 18 GPa.

100. (New) The method according to claim 35, wherein the glass-ceramic abrasive particles have an average hardness of at least 19 GPa.

101. (New) The method according to claim 37, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

102. (New) The method according to claim 37, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

103. (New) The method according to claim 37, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

104. (New) The method according to claim 37, wherein the REO is at least one of Gd_2O_3 , La_2O_3 , or Nd_2O_3 .

105. (New) The method according to claim 104, further comprises grading the glass-ceramic abrasive particles to provide a plurality of particles having a specified nominal grade.

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106. (New) The method according to claim 104 further comprises incorporating the glass-ceramic abrasive particles into an abrasive article.

107. (New) The method according to claim 37, wherein the glass-ceramic abrasive particles have an average hardness of at least 18 GPa.

108. (New) The method according to claim 37, wherein the glass-ceramic abrasive particles have an average hardness of at least 19 GPa.

109. (New) The method according to claim 40, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 1.5 as compared to the comparative glass-ceramic.

110. (New) The method according to claim 40, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 2 as compared to the comparative glass-ceramic.

111. (New) The method according to claim 40, wherein the at least one of Nb_2O_5 or Ta_2O_5 is present in an amount sufficient to increase the rate of crystalline ZrO_2 formation from the glass by at least a factor of 3 as compared to the comparative glass-ceramic.

112. (New) The method according to claim 40, wherein the REO is at least one of Gd_2O_3 , La_2O_3 , or Nd_2O_3 .

113. (New) The method according to claim 40, further comprises grading the glass-ceramic abrasive particles to provide a plurality of particles having a specified nominal grade.

114. (New) The method according to claim 40 further comprises incorporating the glass-ceramic abrasive particles into an abrasive article.

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115. (New) The method according to claim 40, wherein the glass-ceramic abrasive particles have an average hardness of at least 18 GPa.

116. (New) The method according to claim 40, wherein the glass-ceramic abrasive particles have an average hardness of at least 19 GPa.

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